

Dkt. No.: OP-093000139

AMENDMENTS TO THE CLAIMS:

1. (Currently amended) A water-cooling heat dissipation system used to dissipate heat generated by an electronic device, comprising:

a heat sink, mounted on the electronic device, the heat sink having a circulating loop connected to two ends of the heat sink;

~~a water pump connected to the circulating loop at an inlet of the heat sink;~~

a first cooling base installed in the circulating loop at an outlet of the heat sink;[[and]]

a second cooling base installed in the circulating loop at an inlet of the heat sink ~~between the heat sink and the water pump~~, the second cooling base having a cryogenic chip to cool down water flowing therethrough into icy state, ~~and~~

a water pump installed in the circulating loop between the first and the second cooling base.

2. (Original) The system as claimed in Claim 1, wherein the electronic device includes a central processing unit.

3. (Original) The system as claimed in Claim 1, wherein the first cooling base includes a heat sink mounted thereon and a cooling fan mounted on the heat sink.

4. (Currently amended) The system as claimed in Claim 1, wherein ~~the~~ heat sink includes an aluminum extrusion type of fins.

5. (Currently amended) The system as claimed in Claim 1, wherein the cryogenic chip includes a cold surface attached to the ~~second~~ cooling base and a hot surface.

6. (Original) The system as claimed in Claim 5, wherein the second cooling base further includes a heat sink mounted on the hot surface of the cryogenic chip and a cooling fan attached on the heat sink.

7. (Original) The system as claimed in Claim 6, wherein the heat sink includes an aluminum extrusion type of fins.

AMENDMENT

10/827,277

- 2 -

Dkt. No.: OP-093000139

REMARKS

Claims 1-7 are pending in this application. The Examiner has rejected claims 1-3 and 5-6, and claims 4 and 7 under 35 U.S.C. §103(a) as being unpatentable over Meir (6,567,262) and further in view of Noda et al. (6,698,500), respectively.

Meir's high power active cooling system as in Figure 1 has different arrangement from Applicants' water-cooling heat dissipation system as in Figure 2. The amended claim 1 of the invention discloses that the second cooling base 5 including the cryogenic chip 6 is connected between the heat sink 1 and the water pump 3 from the water inlet end of the circulating loop 2. In stead, Meir's heat sink 18 including the thermal electric cooler (TEC) 14 is connected between the heat sink 20 and the pump 22 from the outlet end of the cooling liquid circuit 16. The arrangement of Applicants' invention can provide much cooler water to directly supply for cooling CPU. However, according to Meir's arrangement, the cooling liquid has to pass through the pump before providing for cooling. As such, the cooling liquid will absorb more heat, especially during through the pump, and the cooling effect is reduced. That is, Applicants' invention can provide more efficient cooling system than Meir's.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or the combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claimed limitations.

There is not any suggestion or desirability for Meir or further combining Noda to

AMENDMENT

10/827,277

- 3 -